

Impact of the MJO events during CINDY/DYNAMO field campaign on the circulation in the Indonesian Seas

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The remote ocean response to the Madden-Julian Oscillation (MJO) events observed during the CINDY/DYNAMO field campaign is investigated using the global eddy-resolving HYbrid Coordinate Ocean Model (HYCOM). We use the version of global HYCOM with horizontal resolution 1/12 deg. with 32 layers in the vertical. The model is integrated with archived operational forcing from the Navy Operational Global Atmospheric Prediction System (NOGAPS) for the period 2011-2012 that covers the field phase of CINDY/DYNAMO.

During the intensive observation period of CINDY/DYNAMO field campaign, three active episodes of large-scale convection associated with the MJO passed eastward across the tropical Indian Ocean. Surface westerly winds near the equator were particularly strong during the events in late November and late December, exceeding 10 m/s. These westerlies generate strong eastward jets ($>1\text{m/s}$) on the equator, and downwelling near the eastern boundary. These equatorial jets are realistically simulated by HYCOM. The analysis of the model output demonstrates that anomalous positive SSH at the eastern boundary propagates along the coast of Sumatra and Java as coastal Kelvin waves, which largely reduces the Indonesian Throughflow transport at Makassar Strait during January- February.